



EXPLOSIVES SAFETY STANDARDS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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(MSgt Monty N. Vaughn)
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AFMAN 91-201, 18 October 2001 is supplemented as follows:

It applies to all United States Air Forces in Europe (USAFE) and any additional United States Air Force active duty/Reserve/National guard units deployed to bases under USAFE operational control. Additionally, units that deploy to Royal Air Force bases in the United Kingdom must adhere to Ministry of Defense (MOD) explosive safety requirements outlined in the 3rd Air Force (3AF) supplement to this document. Requests to obtain this supplement will be sent to 3rd Air Force Weapons Safety (3AF/SEW), Unit 4840 Box 50, APO AE 09459-0050. Any USAFE subordinate unit may supplement this manual provided a copy of the supplement is sent to Command Weapons Safety Division (HQ USAFE/SEW), Unit 3050 Box 165, APO AE 09094-0165 and approved before publication. If compliance with more restrictive host nation standards is mandated by international agreement, USAFE Numbered Air Force (NAF) units must publish a NAF supplement to this manual that provides the necessary directives to comply with the international agreement. Lastly, send recommended changes or comments to HQ USAFE/SEW, through appropriate channels, on Air Force Form 847, **Recommendation for Change of Publication**. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual 37-123, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS).

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

1.1.5. Numbered Air Forces Weapons Safety (NAF/SEW) must review all appropriate Status of Forces Agreement (SOFA), Memorandum of Agreements/ Understanding (MOA/MOU) or any other bilateral and multilateral agreements with each host government for local explosive safety directives.

1.1.5.1. (Added) Document the analysis followed for determining if there is an international agreement, what notification procedures an international agreement may require, and whether the appropriate level of host nation approval has been sought after NAF/SEW review. In situations where there are:

1.1.5.1.1. (Added) US exposures to host nation military resources (i.e. personnel, property).

1.1.5.1.2. (Added) US exposures to host nation civilian resources; or

1.1.5.1.3. (Added) Host nation exposures to US military or civilian resources.

1.1.5.2. (Added) Send completed documents through appropriate channels to HQ USAFE/SEW. If the international agreement does not establish clear guidance, the NAF/SEW must initiate a requirement for an appropriate international agreement through NAF/Plans to establish an explosive exposure notification and approval level process between the US government and each host government. At USAFE bases, safety distances in Allied Ammunition Storage and Transport Publication-1 (AASTP-1, formerly NATO AC/258 - D/258) or host nation criteria, or USAF criteria, as applicable (whichever is more restrictive), apply to exposures outside the base boundary. Contact HQ USAFE/SEW for assistance in determining which criteria is applicable.

1.1.6. (Added) NAF/SEW will:

1.1.6.1. (Added) Monitor weapons safety activities within the NAF to ensure compliance with applicable safety directives relative to explosives storage, handling, and transportation.

1.1.6.2. (Added) Provide guidance and or supplementary directives to clarify host nation requirements in accordance with directives from higher headquarters.

1.1.6.3. (Added) Review requests for waivers, exemptions, or deviations from Quantity-Distance (Q-D) criteria to ensure compliance with host nation publications and verify mission outweighs all risks associated with the operations and compensatory measures are attainable.

1.1.6.4. (Added) Review site plans to ensure they do not violate host nation requirements.

1.1.7. (Added) The Wing/SEW will periodically review the appropriate sections of the SOFA, MOA and other local agreements, which define US/host nation responsibilities impacting weapons safety. Where the responsibilities and criteria differ from these in local agreements or host nation imposed rules, HQ USAFE/SEW will be notified of the specific difference.

1.2.2. Following notification, the Wing/SEW must make every attempt to attend concept, design, and pre-construction conferences. At this time, explain all applicable explosive safety rules to the contractor's representatives, establish oversight requirements, and comply with requirements in AFMAN 91-201, *Explosives Safety Standards*, paragraph 3.2.3.6. Nothing in the contract will prevent Wing/SEW personnel from performing visits to contractor sites within an explosive clear zone.

1.2.3. Where standards and criteria expressed in this publication differ from those of a host nation base, contact HQ USAFE/SEW for resolution of differences. In all cases, requesting units will perform a risk assessment of hazards and review real property records to ensure the unit commander has been fully apprised of the risks and accepts them based on the tradeoffs between mission accomplishment and mission impact in the event of a mishap.

1.2.3.4. Coordinate justifications on net explosives weights through Nuclear and Conventional Weapons Division (Wing/LGW), (NAF/LGW) and Nuclear and Conventional Weapons Division (HQ USAFE/A4W).

1.4.2. This responsibility will be performed by the owning NAF in coordination with the sponsor unit to prevent conflicts with future construction plans. Prior to deployment of aircraft and personnel, the deploying unit will verify explosives site plans exist with NAF/SEW and HQ USAFE/SEW and will meet the operational need for the deployment. If no explosives site plans exist, or the current plans do not meet the operational need, ensure explosives site plans are accomplished. Provide current copies and updates of site plans to HQ USAFE/SEW, Chief Programs Division (HQ USAFE/A7CP) and NAF/SEW at least 45 days prior to start of operations. Plans will include the following information as a minimum: list of existing explosives sited facilities on base, including facility number, type of facility, sited weight, approved operating explosives weights, and siting and operating restrictions.

1.4.2.2. Include definitive drawings or floor plans of explosives operating locations. If joint use, specifically identify portions allocated to US and other forces. If joint use, comply with paragraph 3.8.9. of the basic publication.

1.4.2.5. (Added) A map showing primary and alternate munitions transportation routes.

1.4.2.6. (Added) Maps showing munitions storage and operating sites including holding areas and arm/dearm pads, hazardous cargo areas, and authorized combat aircraft parking locations.

1.6. (Added) **Contingency Risk Assessment and Review Responsibilities.** In the event of increased hostilities, Contingency Operations, or Military Operations Other Than War (MOOTW), there is need to quickly assess the risks innate with the storage of munitions and the operations necessary to ready these munitions for use. DOD 6055.9-STD, *DoD Ammunition and Explosives Safety Standards*, Chapter 10 authorizes the use of a Risk Assessment in such temporary situations. Refer to paragraph 4.3.1.3. of the basic publication.

1.6.1. (Added) The definition that accompanies this temporary situation: Those facilities for operations that are either not expected to last for protracted periods of time (12 months or less) or are of such short-notice that advanced planning and approval are impossible. When enacting this definition of a temporary situation, the appropriate level commander shall approve a plan for the specific scenario. The plan shall detail the following:

1.6.1.1. (Added) A risk assessment for the proposed operation. This assessment will weigh the need for the facility against the potential effect of a mishap in terms of mission impact, loss of resources, turnaround times, etc. Conduct a risk assessment according to paragraph 1.5. of the basic publication. Include a description of the likelihood, exposure, and possible consequences of a mishap for those situations where QD standards are not met.

1.6.1.2. (Added) Milestones for transitioning the function to a "permanent" type of operation or for the cessation of explosives operations.

1.6.1.3. (Added) Updates to the risk assessment will be provided as the explosives environment changes. Ideally, any increases in risk should be approved at the appropriate level. In contrast, decreases in risk can be accomplished with notification of changes after accomplishment.

1.6.2. (Added) Determine the appropriate approval level using the applicable nomograph in Chapter 5, Figure 5.2. of the basic publication. Signatures of the risk assessment indicate:

1.6.2.1. (Added) All alternatives have been considered and rejected.

1.6.2.2. (Added) The level of risk is acceptable for the operations to be conducted.

1.6.2.3. (Added) The approval authority's acceptance of the additional risk is recommended.

1.6.3. (Added) Explanation of control measures to mitigate risk from temporary operations. This explanation will include delineation of notification procedures for affected organizations and required implementation actions. The requirements described in paragraphs 4.10.3.1 through 4.10.3.4. of the basic publication will be included in this explanation.

1.6.4. (Added) HQ USAFE/SEW will coordinate risk assessment packages with Operations (A3), Plans and Programs (A5), Judge Advocate (A4), Judge Advocate (JA), and Civil Engineer (A7C) as required. Safety (SE) or Weapons Safety (SEW) signatures indicate:

1.6.4.1. (Added) The risk is accurately described.

1.6.4.2. (Added) The package is complete and legally sufficient based on the HQ staff reviews.

1.6.4.3. (Added) All actions to mitigate the risk have been considered.

1.6.4.4. (Added) Risk mitigation is described.

1.6.4.5. (Added) The approval level indicated is appropriate for acceptance of the risk associated with the operation described.

1.6.5. (Added) Document risk assessments involving exceptions to QD according to **Attachment 12 (Added)** or similar format with all required information.

2.2. Provide pre-task safety briefings to all personnel involved in explosive operations, to include casuals, prior to start of operations. For nuclear pre-task safety briefings, meet the requirements of AFI 21-204, *Nuclear Weapon Procedures*.

2.3.1. (Added) Locally written instructions for explosive operations can consist of the following: policies, guidance, procedures, and safety briefings; combinations of the same; or stand-alone products. Installation weapon safety validates these locally written instructions. Validation consists of ensuring the locally written instructions contain information required by AFMAN 91-201 paragraph 2.4 and as locally supplemented.

2.4.7. (Added) In USAFE, develop locally written instructions considering the following:

2.4.7.1. (Added) Combat Aircraft Loading. Combat aircraft loading technical orders or checklists provide the required information; therefore, locally written instructions are not required. Pre-task safety briefings consist of the safety portion of the combat aircraft loading technical order or checklist.

2.4.7.2. (Added) Nuclear Munitions. Pre-task safety briefings for maintenance and handling will meet the maintenance and handling crew brief requirements of AFI 21-204, *Nuclear Weapon Procedures*.

2.15. Explosives will not be transported in Privately Owned Vehicles (POV), pockets, or unmarked containers. Transport between two geographically separated exercise areas is authorized provided host nation and United States Air Force transport rules are observed.

2.15.3.10. (Added) Simulators or smoke generators should not be initiated in areas where smoke may cause security difficulties.

2.16. The installation exercise evaluation team chief can satisfy this requirement by developing a single letter that details all exercises under their control, including those in conjunction with higher headquarters inspection and evaluations teams. In addition to a risk assessment and detailed list of authorized explosives, include in its content the minimum distances stated in AFMAN 91-201, paragraph 2.15.3 and any other limitations imposed. Coordinate letter with wing/SEW. Once signed by the installation commander, a copy must be maintained by the exercise team chief and the installation weapons safety office.

2.21.2.3. Other operational factors include the unit Bird Aircraft Strike Hazard (BASH) program.

2.22. At non-US controlled installations, fire extinguisher training will include how to operate host nation extinguishers.

2.25.7.1. In facilities where multiple doors are located between the exterior door and the room containing the explosives, fire symbols are only required on the exterior door and the innermost door. With local fire chief approval, if fire symbols are posted on the exterior of the building and visible from all approach roads, additional fire symbols are not required on the exterior door.

2.26.2. Storage of firearms in explosives storage areas is authorized for operational necessity.

2.27.6. Civil Engineering will perform annual earth cover depth checks and maintain most recent records of actual measurements and date accomplished. A7C will provide facility custodians with copies of the most recent documentation.

2.28.4. The use of outdoor storage as a temporary expedient is approved.

2.32.8. This does not prevent the use of pneumatic nail guns at operating locations or inside International Standardization for Organization (ISO) containers for the purpose of blocking and bracing or similar operations. Pneumatic nail guns will not be used on munitions containers.

2.35. Geographically Separated Unit (GSU) Additional Duty Weapons Safety Officer (ADWSO)/NCO is authorized to issue licenses provided they have received additional duty weapons safety training from parent wing SEW. The parent wing SEW will coordinate on and review all licenses, prior to final approval. The parent SEW will also accomplish an inspection of all licensed facilities at least annually. This inspection may be in conjunction with an annual inspections or Staff Assistance Visits (SAV). Document the results of these inspections. At deployed locations where no Munitions Accountable Supply Officer (MASO) is present, the responsible munitions custodian will coordinate on the license. USAF units in the United Kingdom are authorized to use RAF Form 1003A (USAF) in lieu of an AF Form 2047, **Explosive Facility License**.

2.35.8. Weapons safety offices can make minor modifications to existing AF Form 2047 (i.e. pen and ink changes to remarks section) without rewriting the entire form.

2.36. This exception applies for locations storing 1000 rounds or less of bird kill ammunition, provided the bird scare ammunition is stock listed in T.O. 11A-1-46 and or the Joint Hazard Classification System (<http://www.dac.army.mil/esidb/esidblogin.asp>) and is designated as Hazard Class/Division 1.4, compatibility group S.

2.37.5.1.1. (Added) The Maintenance Group/Commander (MXG/CC) in coordination with the Wing Weapons Manager and wing safety staff will develop and publish specific criteria for recovery and safing of aircraft returning with jammed guns. Published instructions will address, at a minimum, recovery and parking locations, notification procedures, specific End of Runway (EOR) safing procedures, safing team composition, disposition of damaged guns and ammunition and personnel protective equipment (as required). When operating at deployed bases and Forward Operating Location (FOL), Wing Weapons Managers will ensure that assigned 2W1 personnel adhere to guidance in AFMAN 91-201.

2.58. At Main Operating Base (MOB), the installation communications squadron unit will assist the local wing safety office when conducting Electromagnetic Radiation (EMR) surveys. The base additional duty frequency manager will provide available radio frequency data necessary to perform these surveys. The wing safety office will maintain the EMR survey for the base. At Munitions Support Squadron (MUNSS)

and GSUs, the unit weapons safety manager will coordinate with the host to develop and maintain the EMR survey.

2.58.1. The unit SEW will identify the minimum safe separation distance for each identified transmitting antenna with regards to weapons safety. Safe separation distances that could impact weapons safety will be depicted on the Installation Map, Tab D-8. If a separate EMR map is maintained as an attachment to the Installation Map, Tab D-8, the EMR hazard zones that impact munitions operations may be depicted here.

2.59. Authorization to carry in-use ammunition into base facilities is restricted to hazard class/division 1.4 items unless required by essential mission needs or immediate security. In-transit munitions trailers positioned in front of an aircraft or Protective Aircraft Shelter (PAS) for loading/unloading are exempt from QD, provided munitions are immediately loaded/unloaded and the loaded trailer is then moved to a sited explosive location. If the munitions trailer will not be immediately loaded/unloaded, it must be parked in an explosive sited location (i.e. inside the PAS or within the sited footprint of the Combat Aircraft Parking Area/Hot Cargo Pad (CAPA/HCP)).

2.64.3. USAFE units may mix compatibility types in accordance with this paragraph. However, keep amounts limited to the absolute minimum required to complete these operations.

2.64.4. The local Explosive Ordnance Disposal (EOD) unit is the only qualified agency authorized to determine if the condition of dangerously unserviceable munitions is safe for transportation. Drivers responsible for the transporting dangerously unserviceable munitions must possess a written EOD authorization document during the entire phase of transportation.

3.2.1.1. Quarterly easement inspections are only required where no formal easement has been established with the local government. At USAFE bases in Germany, the responsible safety office will coordinate with Civil Engineering to ensure requirements of USAFE Instruction 32-9001, *Establishing Exterior Protective or Safety Zones (Schutzbereiche) in Germany*, paragraph 12, are being accomplished.

3.2.2.10. (Added) Bus stops with a shelter located on military roads and used exclusively by personnel supporting the Potential Explosive Site (PES) require separation of 100 feet separation. Site all other bus stops with shelters located on military roads at Public Traffic Route (PTR) or Inhabited Building (IB) distance, as appropriate.

3.2.2.11. (Added) Use National Fire Protection Association (NFPA) standards to separate any unmanned towers whose loss has no impact on mission accomplishment. Separate any other unmanned towers such as radio, microwave, weather, etc. using incremental PTR distance, if loss can impact mission accomplishment. This paragraph does not apply to power line towers and water towers; see the basic manual for guidance on these towers.

3.3. Similar explosives operations within a single work center may be conducted concurrently however, work center supervisors should only do this when mission requirements dictate. For example, different inspections (i.e. Return Munitions Inspection, Pre-Issue Inspection, Shipping Inspection, etc.) may be performed in a single inspection bay, AIM-120 and AIM-9 operations may occur in a single missile maintenance bay, and chaff/flare build up operations are authorized in a single conventional maintenance bay. (This list of examples is not all-inclusive).

Table 3.2.

NOTES 2. (Added) See specific Net Explosives Weight (NEW) limits for PAS with Weapons Storage and Security System (WS3) in AFI 91-112, *Safety Rules for US Strike Aircraft* or AFI 91-113, *Safety Rules for NON-US NATO Strike Aircraft*.

Table 3.3.

NOTES 12. Do not site for “doors open” if the sole reason is inoperable doors and a work order to repair the doors has been submitted. Include the work order reference in siting documentation. Until doors are repaired, operate under "doors-open" criteria.

NOTES 22. MAJCOM Commander or Vice Commander (CC/CV) approval is required to use K11 separation between multiple groups holding 24 aircraft or more. When reduced separation is applied to aircraft groups, including aircraft from allied nations, notify the local allied commander of the hazard to his/her aircraft and personnel, and obtain approval if required by host-nation agreement.

NOTES 24. Site water distribution mains, pump houses, and electrical transformers, switches, or substations supporting an explosives area or flightline at reduced separation based on the impact their loss would have on mission accomplishments. If the commander determines the loss is acceptable and will not degrade the mission, no Q-D is required; however NFPA separation distance still applies.

NOTES 30. The use of this note has been authorized by HQ USAFE Vice Commander for all USAFE bases with military-use only runways. HQ USAFE/SEW maintains a file copy of the authorizing memorandum. A copy of the most current memorandum can be obtained at the USAFE Safety web page, <https://wwwmil.usafe.af.mil/direct/se/index.htm>. HQ USAFE/SEW will ensure this memorandum is updated whenever necessary.

NOTES 43. Use K30 (or IB for 1.2.x munitions) if aircraft survivability is desired. No Q-D separation may be applied for short periods if available aircraft parking area(s) are extremely limited and mission requirements dictate.

NOTES 66. Runway arresting systems and weather instruments do not require Q-D separations.

Table 3.15.

NOTES 8 (Added) The following facilities can be considered related facilities from PAS or CAPA (at units which employ WS3 as a means for storage), and should be added to row 1, Facility column - Command Post, Local Monitoring Facility, Remote Monitoring Facility (RMF), Weapons Load Monitor Facility, and WS3 Maintenance office. Row 4 applies to portable facilities used as designated smoking areas; however, fire chief approval is still required per paragraph 2.11. Note 7 also applies to flight line storage locations.

3.13.3.2.1. (Added) Facilities are often shared by different organizations within the logistics and operations groups. If the predominant user(s) of a facility is/are related, site those related facilities using Intra Line (IL) separation when the hazard is not present on a day-to-day basis. Include control measures to eliminate hazards to the “unrelated” users of this facility. Options for measures to control the risk may include evacuation of unrelated personnel (when munitions are present or increased to a NEW that represents a hazard), or limiting the NEW of munitions at the PES to meet the appropriate QD standard. This guidance is based on siting and use of existing facilities. Describe this situation and control measures in the site plan for the facility.

3.13.3.3.1.1. (Added) Any A4 function that perform on or off-equipment maintenance in direct support of combat sortie generation, e.g., LG commander's and staff office; maintenance squadron flights/elements such as Fabrication, Accessories, Aerospace Ground Equipment (AGE), Maintenance, Armament, Propulsion, Egress, Avionics, TMDE; Supply Squadron flights/elements such as Fuels; Logistics Support Squadron flights/elements such as Quality Assurance, Logistics Plans and Mobility processing or equipment storage areas, Maintenance Training, etc.

3.13.3.3.1.2. (Added) Any Operation Group (OG) function that directly supports combat sortie generation, e.g., OG commander's and staff office; Operations Support Squadron flights/elements such as Airfield Operations, Weather, Weapons Load Barn, flying squadron staff offices and flights/elements to include support sections, break areas, equipment storage areas, etc.

3.13.3.3.6. (Added) Any facility whose primary purpose is to house an aircraft, e.g., aircraft maintenance or paint/wash hangar, engine hush house/engine test cells.

3.20.3. The use of Table 3.17. may be authorized for war plan tiered explosive site plans on a case-by-case basis. An Explosive Site Plan (ESP) must be submitted by the unit and approved by the MAJCOM/CC before using the distances in Table 3.17. When siting a PAS with WS3 using Table 3.17, control measures must be developed and documented to ensure that Table 3.16 criteria or equivalent K30 protection is afforded during all weapons or vault maintenance operations (to exclude alarm response) within the PAS.

Table 3.16.

NOTES 2. Do not site a PAS for "doors open" if the sole reason is inoperable doors and a work order to repair the doors has been submitted. Include the work order reference in the siting documentation. Implement control measures to ensure aircraft in a PAS with open doors for extended periods is given K30 protection. Until doors are repaired, operate under "doors-open" criteria.

NOTES 3. (Added) See specific NEW limits for PAS with WS3 in AFI 91-112 or AFI 91-113.

Table 3.17.

NOTES 9 (Added) See specific NEW limits for PAS with WS3 in AFI 91-112 or AFI 91-113.

3.23.3. Mixed storage is authorized, based on operational necessity as determined by the responsible commander.

3.25.2. UFC 3-260-01, *Airfield and Heliport and Design* (formerly AFMAN (I) 32-1123), identifies airfield explosives prohibited areas. Units must coordinate with Civil Engineering to ensure compliance with USAFE Airfield/Airspace distance criteria. If Airfield/Airspace criteria cannot be met, the unit Civil Engineering must submit for the appropriate waiver in accordance with UFC 3-260-01, Attachment 2.

3.25.4. Refer to paragraph **2.59.** of this supplement for additional guidance.

3.29.7. (Added) External fuel tanks intended for use on specific aircraft may be stored in PAS with no separation required.

4.3.1. Explosive Site Plans (ESPs) for GSUs will be developed and submitted by the GSU Weapons Safety Manager (WSM), with assistance from the parent wing WSM, as required. GSU ESPs will be reviewed and signed by the USAF GSU commander, parent wing commander, NAF commander (if required by the NAF), and appropriate staff agencies at MAJCOM. Coordination with host nation author-

ities is required when QD exceptions occur, or when host nation PES NEW is being limited by USAF Exposed Site (ES); obtain approval if required by host-nation agreement.

4.3.5. The base safety office and the base Civil Engineer will jointly develop formal written procedures (MOA, MOU, OI, etc) to ensure any proposed construction project that falls within explosive clear zones are coordinated through the weapons safety office prior to design phase (i.e. concept phase). Coordinate well in advance of the desired construction period to ensure the unit/SEW has adequate time to obtain DoD Explosives Safety Board (DDESB) approval for the ESP. Failure to do this may result in the loss of the construction project. DDESB or Secretary of the Air force/Office of the Secretary (SAF/OS) (for violations) approval must be received prior to construction start.

4.6.5. (Added) Do not site or include on AF Form 943, **Explosives Site Plan**, the following unmanned, miscellaneous structures, unless identified on the map. **NOTE:** These still require NFPA separation distance. (Not an all-inclusive list):

4.6.5.1. (Added) Small, storage sheds housing non-mission essential equipment such as lawn care items, roads and grounds equipment, etc.

4.6.5.2. (Added) Empty concrete pads (no permanent use). This condition must be stated in the transmittal letter.

4.6.5.3. (Added) Abandoned, uninhabitable buildings. Document the use of these facilities so that reviewers will have information on facility use. **NOTE:** These still require NFPA separation distance.

4.7.1. Approval level for modifications to facilities not covered by a waiver or exemption are delegated to the wing/parent wing commander. Ensure compliance with all requirements of paragraphs 4.7.1.1 through 4.7.1.5. of the basic publication.

4.7.2. The following information will be submitted with modification requests: project number; type and source of funding; mission impact; number of personnel; existing exception number; detailed plan drawings; and other data necessary to evaluate request.

4.8.1. Format will follow normal explosives site planning formats as prescribed in AFMAN 91-201.

4.10. Management action refers to “control measures”. Use operational risk management approaches to develop these measures.

4.10.2. To determine munitions requirements for flight line PES, WSMs should review the wing Design Operational Capability statement, Operations Plans, and the Standards Conventional Loads documentation. Coordinate with the Operations Group or Logistics Group, Wing Weapons and Tactics, Wing Plans, and the Wing Weapons Manager. Current and potential future tasking should be addressed. When PESs are host nation facilities, coordinate with the applicable host nation authorities to determine the munitions requirements and NEW that should be evaluated. For Host Nation Potential Explosive Site (HN PES), also see paragraph 3.8.9. of the basic publication.

4.11. A glass breakage assessment is required for new facilities, or existing facilities to be modified to add windows, or to expand floor space for those with windows. This analysis must evaluate the worst case event likely to expose the internal and external windows to blast hazards. For example, a facility exposed to multiple earth-covered magazines or explosives loaded aircraft would necessitate an evaluation of the PES that would place the maximum PSI on the windows. See **Attachment 13 (Added)** for glass breakage assessment procedures.

4.11.2. Electronic ESPs are the preferred method. If not submitting electronically, submit one hard copy original and 4 copies of the ESP package for exception free site plans and one original plus 6 copies for ESP package involving exceptions. The back page of AF Form 943 containing original signatures will be provided on a separate page from sections I and II. See **Attachment 14 (Added)** for electronic site plan procedures.

4.11.4. Maps of a scale 1:5000 (metric) will serve this requirement. Where more detail is required, submit a 1:2500 for measuring intermagazine distances and others requiring precise measurements. Also, draw a line from the source (PES) to the clear zone and indicate the actual distance along the line. Electronically produced maps will have a scale attached.

4.11.4.1. Do not include ESs that do not require siting themselves, i.e., unmanned, miscellaneous facilities described in paragraph 4.6. of the basic publication. Include a brief description of these facilities in site planning documentation.

4.12. USAFE units who have an Assessment System for Hazardous Surveys (ASHS) program/database will maintain a current database. ASHS will be used for site plan submission. The ASHS database version will be identified in the cover letter of the ESP, or on the AF Form 943. Any changes to the ASHS program/database must align with A7C-established and maintained mapping data (i.e. Installation layout/C-1 Maps, Short Range Development Plan/M-2 Maps) and be used as the sole data source.

4.13.3. (Added) Units desiring to use a different format may submit a draft site plan for review and approval by HQ USAFE/SEW. Once approved, the unit may use this site plan format for all submissions or as defined by the HQ USAFE/SEW. Any proposed format should contain all substantial information required in this manual (also see paragraphs 4.11.5 or 4.11.6 of the basic publication).

4.44. When an automatic sprinkler system is installed in an explosive storage or operating location, measures must be taken to ensure protection of those munitions that react violently with water (Apply No Water (ANW)). These measures could include a manual shut-off valve, separate room/bay with no sprinkler, or protective cover over those explosives designated as ANW. Procedures must be documented in a local OI, coordinated through the wing/SEW, and approved by the base fire chief.

5.2.5. HQ USAFE/SEW is the approval authority for deviations and the unit/SEW is responsible for performing and documenting deviation reviews. If there is a potential for a loss of munitions, a risk assessment and acceptance of loss is required.

5.3.3. Notification of hazards to host nation or allied commanders participating in joint operations may be made during joint operations briefings or through official correspondence. Notification does not imply nor require acceptance. Obtain approval if required by host-nation agreement.

5.4.1. Affected unit will forward a memorandum listing the waiver/exemption number, date reviewed, and a statement that the waiver/exemption is still valid through the Wing/NAF to HQ USAFE/SEW.

5.5.2.4.3. When determining the possible consequences do not include the cost of the PES where the mishap may occur. Possible consequences should focus on the mission impact; cost of damage or loss, and injuries to personnel at the ES, which does not meet required Q-D separation. For example, if the mishap PES is a PAS with an aircraft, do not include in the value of the PAS, the aircraft or other equipment located in the PAS to support explosive operations, and do not include the number of people directly performing the explosive operation.

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION***Abbreviations and Acronyms*

3AF—Third Air Force

ADWSO—Additional Duty Weapons Safety Officer

ANW—Apply No Water

ASHS—Assessment System for Hazardous Surveys

BASH—Bird Aircraft Strike Hazard

CAPA—Combat Aircraft Parking Area

ESP—Explosive Site Plans

FOL—Forward Operating Location

HCP—Hot Cargo Pad

H C/D—Hazard Class/Division

HN—Host Nation

ISO—International Standardization for Organization

MASO—Munitions Accountable Supply Officer

MOA—Memorandum of Agreement

MOB—Main Operating Base

MOD—Ministry of Defense

MOOTW—Military Operations Other Than War

MOU—Memorandum of Understanding

MUNSS—Munitions Support Squadron

NAF—Numbered Air Force

PAS—Protective Aircraft Shelter

PES—Potential Explosive Site

RMF—Remote Monitoring Facility

USAFE—United States Air Forces in Europe

WS3—Weapons Storage and Security System

WSM—Weapons Safety Manager

A4.4.1. Column 6 will include the type of exposure (front, side, or rear) when the PES or ES is a PAS or an igloo. If both the PES and the ES are either a PAS or igloo, include the type of exposure requiring the greatest separation. For example, when the frontal exposure to the side of another PAS is the driving separation, indicate so with Front (bldg #) to Side (bldg #). Columns 7 and 8, will contain NEW and Hazard

Class/Division (H C/D) for those munitions that are authorized and available for the unit to use (i.e. if there are no munitions of H C/D 1.2.3 then it is not necessary to have a sited NEW).

Attachment 12 (Added)

RISK ASSESSMENT FORMAT

A12.1. (Added) DESCRIPTION OF EXPLOSIVE OPERATIONS AT PES: Include any pertinent information to help the reviewer understand the nature of explosive operations causing a hazard. For example, describe the number at type of aircraft, the type and quantity of munitions employed, the operations tempo, etc.

Table A12.1. (Added) PES name and facility number.

NEW	1.1	1.2.1>100	1.2.1<100	1.2.2	1.2.3	1.3	1.4
Sited							*

Include the applicable HC/D causing QD exceptions.

Table A12.2. (Added) Exposed Sites at less than the minimum required quantity-distance separation.

ES Facility Number	ES Facility Name/Type	ES Using Organization	No. of People	Haz Cl/ Div	Req'd Sep Fac	Req'd Dist	Actual Sep Factor	Actual Distance	Actual PSI	Approval Level
	NO ADDITIONAL FACILITIES									

A12.2. (Added) SUMMARY OF RISKS: For each ES that does not meet standards discuss the possible consequences of a mishap at the PES. Include a description of the USAF Prescribed Risk versus the Actual Risk Causing an Exception. The prescribed risk is the acceptable level of hazard inherent in all explosive operation and meets QD standards. Express this in K factor and PSI. The actual risk causing an exception is the hazard, expressed in K factor and PSI that requires a commander’s approval. When the number of ES hazarded makes describing each exception to QD overly burdensome, ES may be grouped by type, e.g., IB, IL, PTR, etc., or by K factor. Amount of damage to buildings or equipment, and injuries to people must be discussed. Any hazards to non-combatant host nation civilians or US must be addressed. Commanders must understand the total impact to USAF and host nation facilities, resources, people, and mission capability created by exceptions to QD, should a mishap occur.

A12.3. (Added) CONTROL MEASURES AND ALTERNATIVES: Discuss management actions (control measures) planned to mitigate or eliminate risks from explosive operations causing QD exceptions. If no control measures are planned, discuss your evaluation of alternatives.

A12.4. (Added) WAIVER APPROVAL LEVEL DETERMINATION: If control measures cannot eliminate QD exceptions, the likelihood, exposure, and possible consequences of a mishap must be explained. Follow the instruction in Chapter 5 of the basic publication for categorizing likelihood, exposure, and possible consequences. The review and approval authority must understand the impact on mission accomplishment, the number of people expected to be injured or killed, and the estimated cost of damages to facilities and resources. Annotate the proposed approval level for the risk assessment. Other comments or discussion may be included. Any issues regarding application of QD standards should be noted.

Attachment 13 (Added)**GLASS BREAKAGE ASSESSMENT PROCEDURES**

A13.1. (Added) Determine the type, width, length, and thickness of the glass. This information can be derived from the design drawings.

A13.2. (Added) Determine the highest PSI that will be generated from a surrounding PES.

A13.3. (Added) Using GlasTop, identify the PSI that the glass can withstand (GlasTop program can be found at <https://wwwmil.usafe.af.mil/direct/se/index.htm>):

A13.3.1. Enter the glass type.

A13.3.2. Choose the Unit of measure (inches or millimeters). Designers in Europe normally use the metric system. You will have to convert this information to the standard system (inches) for your memorandum.

A13.3.3. Enter the dimension of the glass (i.e. 36, 24, 1.5).

A13.3.4. Select "Type 2" by typing the number 2.

A13.3.5. Type TNT Equivalency (NEW), Range (Distance in feet), and Incidence Angle (Always 0, worst case). (i.e. 5000, 400, 0).

A13.3.6. Press Enter to continue.

A13.3.7. Press Enter again.

A13.3.8. Find the Line "Blast Pressure Capacity." This is the pressure the window can stand if properly installed.

A13.4. (Added) Based on the K factor separation of the PES creating the highest PSI, determine the amount of damage the facility will receive.

A13.5. (Added) If the PSI rating of the glass is higher than the amount of PSI the facility will receive, the glass can be expected to last as long as the surrounding wall.

A13.6. (Added) Document the above information in a memorandum and attach to explosive site plan for the affected facility.

EXAMPLE:

Window Material = 1 "Annealed Glass"

Units = 1 "English"

Dimensions = 36"H, 24"W, 1.5"Thick

NEW = 10000 pounds

Distance = 400 feet

Angle = 0

If entered properly into GlasTop, your peak Blast Pressure Capacity will be 16.70 PSI.

Attachment 14 (Added)

ELECTRONIC EXPLOSIVE SITE PLAN PROCEDURES

A14.1. (Added) Group ESP packages together based on final approval authority. For example, all Numbered Air Force (NAF) approvals in one package, all MAJCOM approvals in another, etc. For small numbers of ESPs, submit in one Portable Document Format (PDF) file. For large numbers of ESPs, submit a separate PDF file for each ESP. **NOTE:** A small number of complex ESPs may require multiple PDF files where as a large number of easy ESPs may be included in one PDF file. Use good judgment when determining number of PDF files to submit. Unit Transmittal Letters may be submitted as a separate PDF file as long as bookmark links automatically open separate ESP PDF files. WG/CC signature on the transmittal letter will suffice in place of Wing Commander (WG/CC) signature on reverse of all AF Form 943.

A14.2. (Added) All PDF files should be book marked and automatically open with bookmarks displayed. For reviewers, all linked files must be stored in the same directory in order for links to work properly.

A14.3. (Added) ESPs that have compensatory measures need WG/CC signature on AF Form 943 or transmittal letter in which compensatory measures are identified. ESPs containing EXCEPTIONS will have supporting documentation according to AFMAN 91-201, paragraph. 5.5.1. This information should be bookmarked behind subject ESP map and before the next AF Form 943.

A14.4. (Added) There are three methods for handling signatures. In order of preference, they are:

A14.4.1. Have the individual sign a paper copy, and then scan the signed copy.

A14.4.2. Insert an electronic signature block into the electronic Word file.

A14.4.3. Type “//Signed//” in the electronic Word file. This method is least preferred and is acceptable only for simple transmittal letters, which do not contain a commander’s risk acceptance, or an agreement to implement mitigation measures.

A14.5. (Added) Depending on the total size of one PDF file, (SECAF EXCEPTION for example), it may be necessary to break the one PDF file into multiple single page files prior to emailing to the next review level. Once a single PDF file is ready to forward, perform a “Save As” function to significantly reduce the file size. Multiple changes to a working copy PDF file increases the file size, even though final content is less than or equal to original content.

A14.6. (Added) NAF/MAJCOM transmittal letters will be sent to the originating unit electronically.

A14.7. (Added) ESP Document Requirements

A14.7.1. As a minimum, each PDF file must contain:

A14.7.1.1. One transmittal letter from NAF (or NAF/CC/CV endorsement on the Wing letter)).

A14.7.1.2. One transmittal letter from the Wing Commander.

A14.7.1.3. Wing Commander Loss Acceptance Letter (if applicable).

A14.7.1.4. Wing Commander Risk Acceptance Letter (if applicable).

A14.7.1.5. PES-ES pairs.

A14.7.1.6. Map with graphic scale.

A14.7.1.7. All EXCEPTION Nomographs (if applicable).

A14.7.1.8. A7C review Letter for Lighting Protection System Drawings.

A14.7.1.9. Facility Design Drawings (as applicable).

A14.7.1.10. Glass Breakage Assessments (as applicable).

A14.8. (Added) Book Marking Instructions

A14.8.1. Select File

A14.8.2. Document Info

A14.8.3. Open Menu

A14.8.4. Check “Bookmarks and Page” option

A14.9. (Added) Linking PDF Files

A14.9.1. To link bookmark to another PDF file:

A14.9.1.1. Create a bookmark

A14.9.1.2. Right mouse click properties

A14.9.1.3. Select action type

A14.9.1.4. Open File

A14.9.1.5. Select File

A14.9.1.6. Navigate to PDF file

A14.9.1.7. Select PDF file

A14.9.1.8. Open: Set Action

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Director of Safety